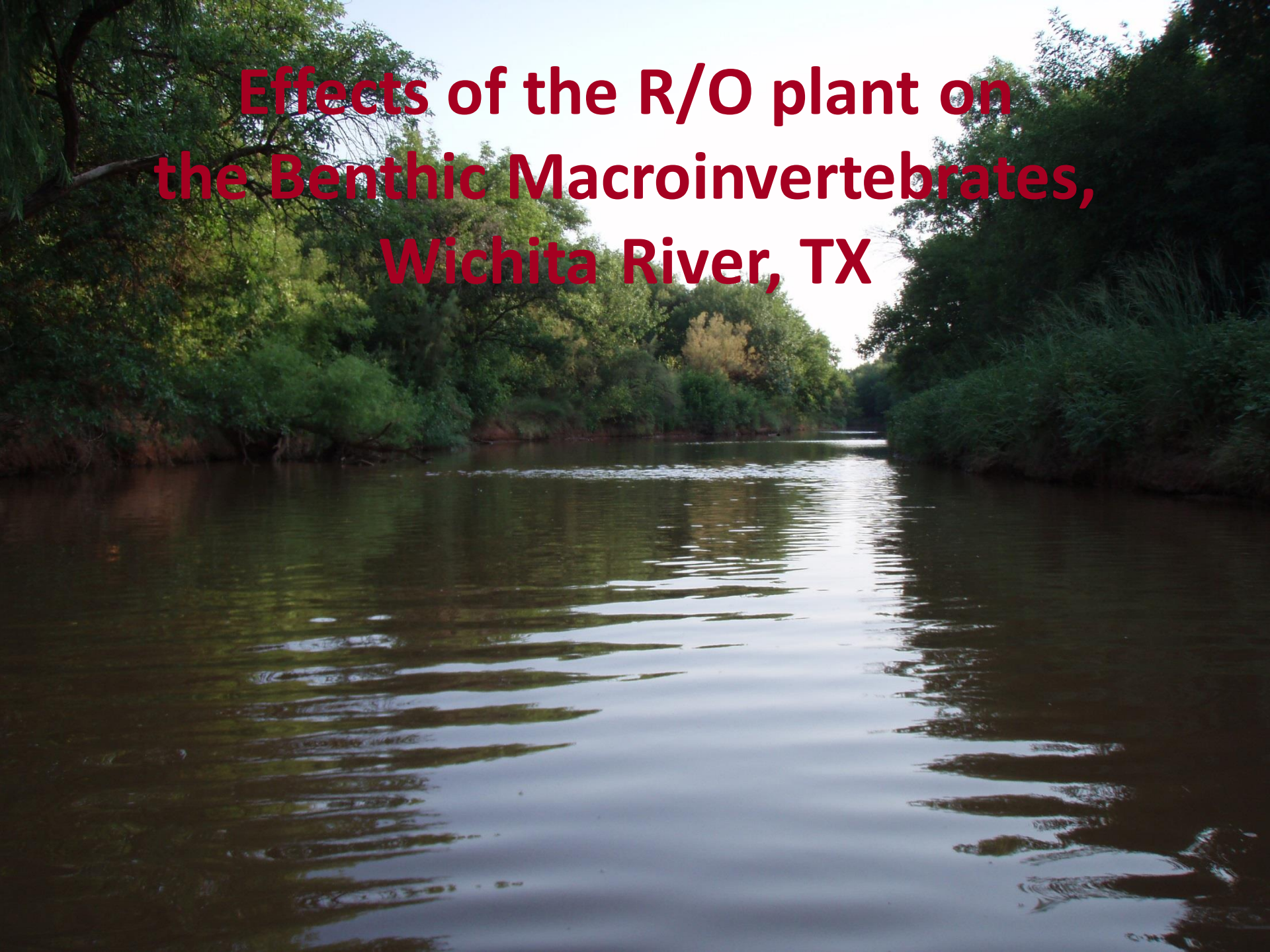
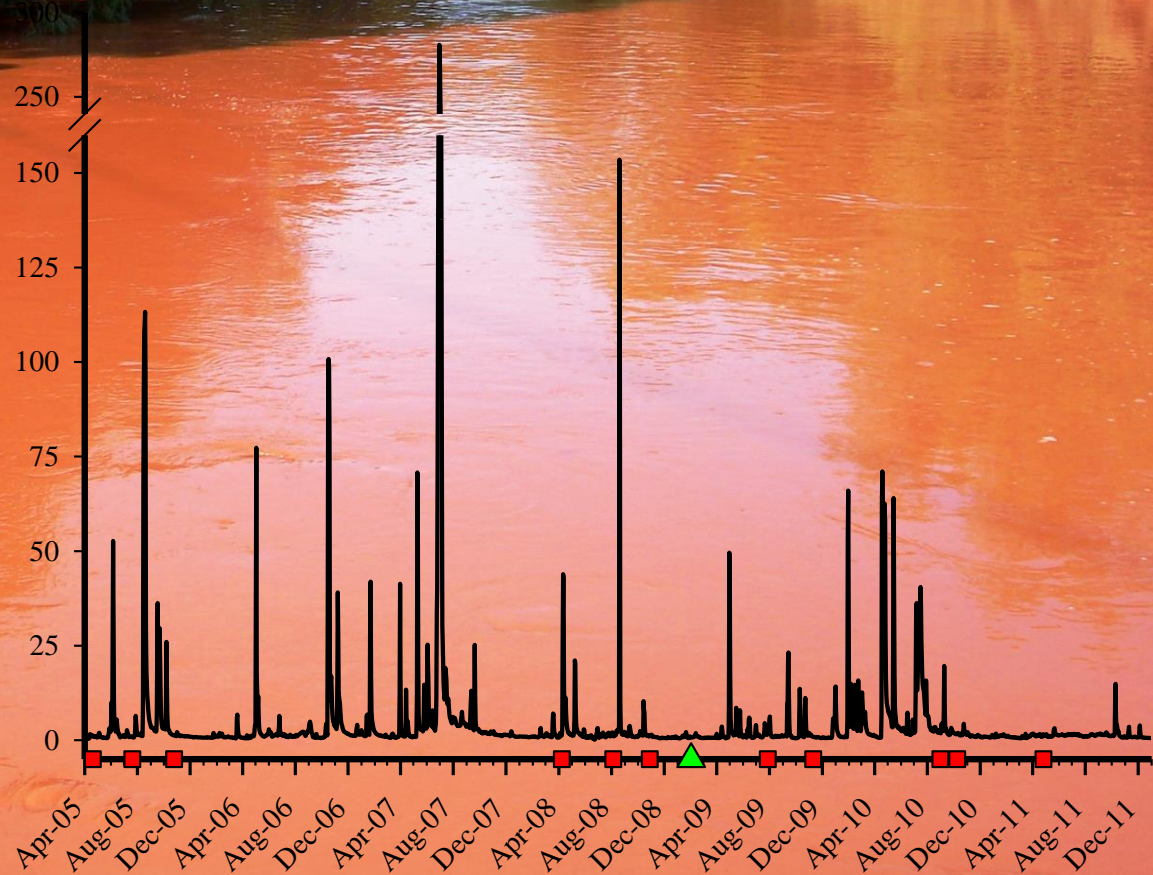


Effects of the R/O plant on the Benthic Macroinvertebrates, Wichita River, TX



High flow event, with elevated discharge of red clay



Overview Map

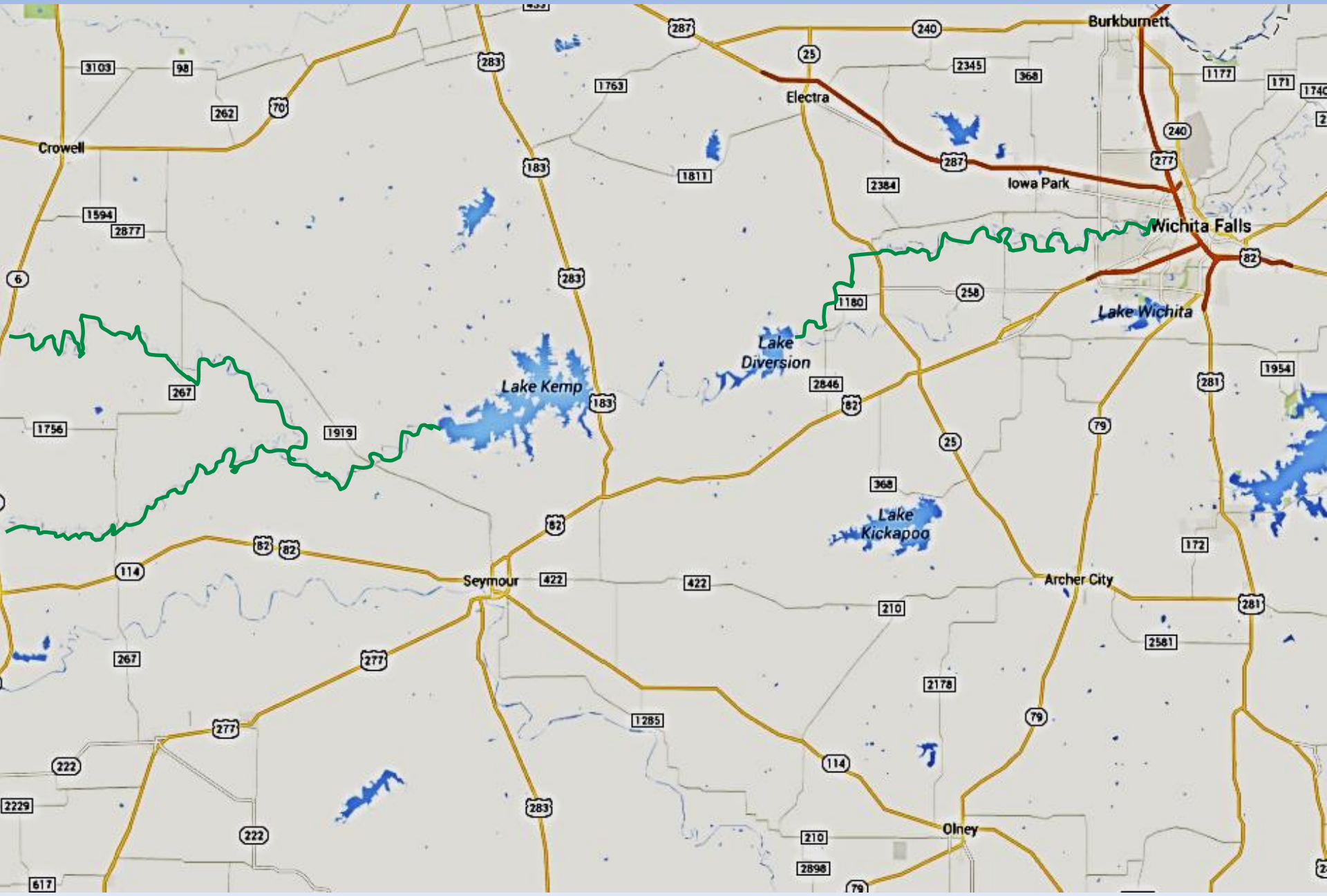
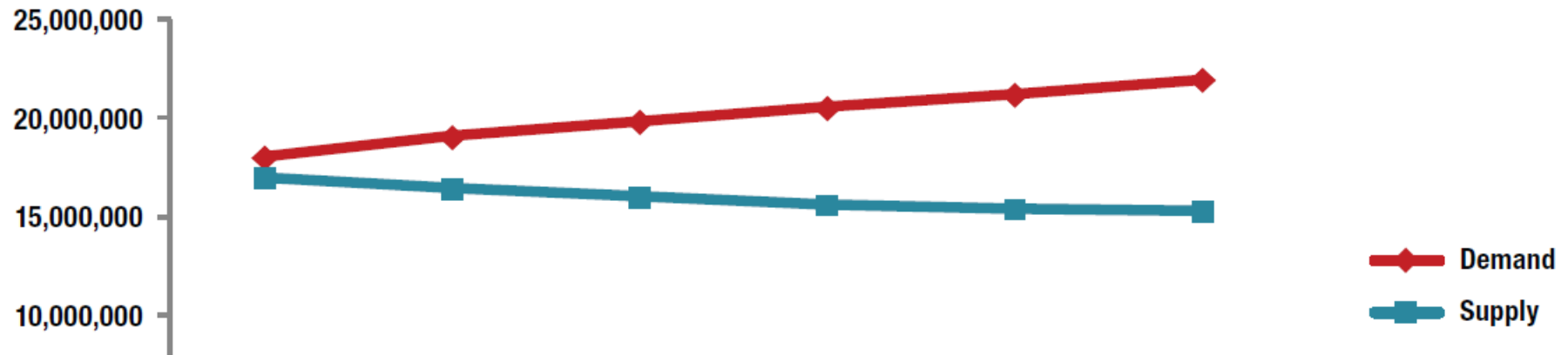
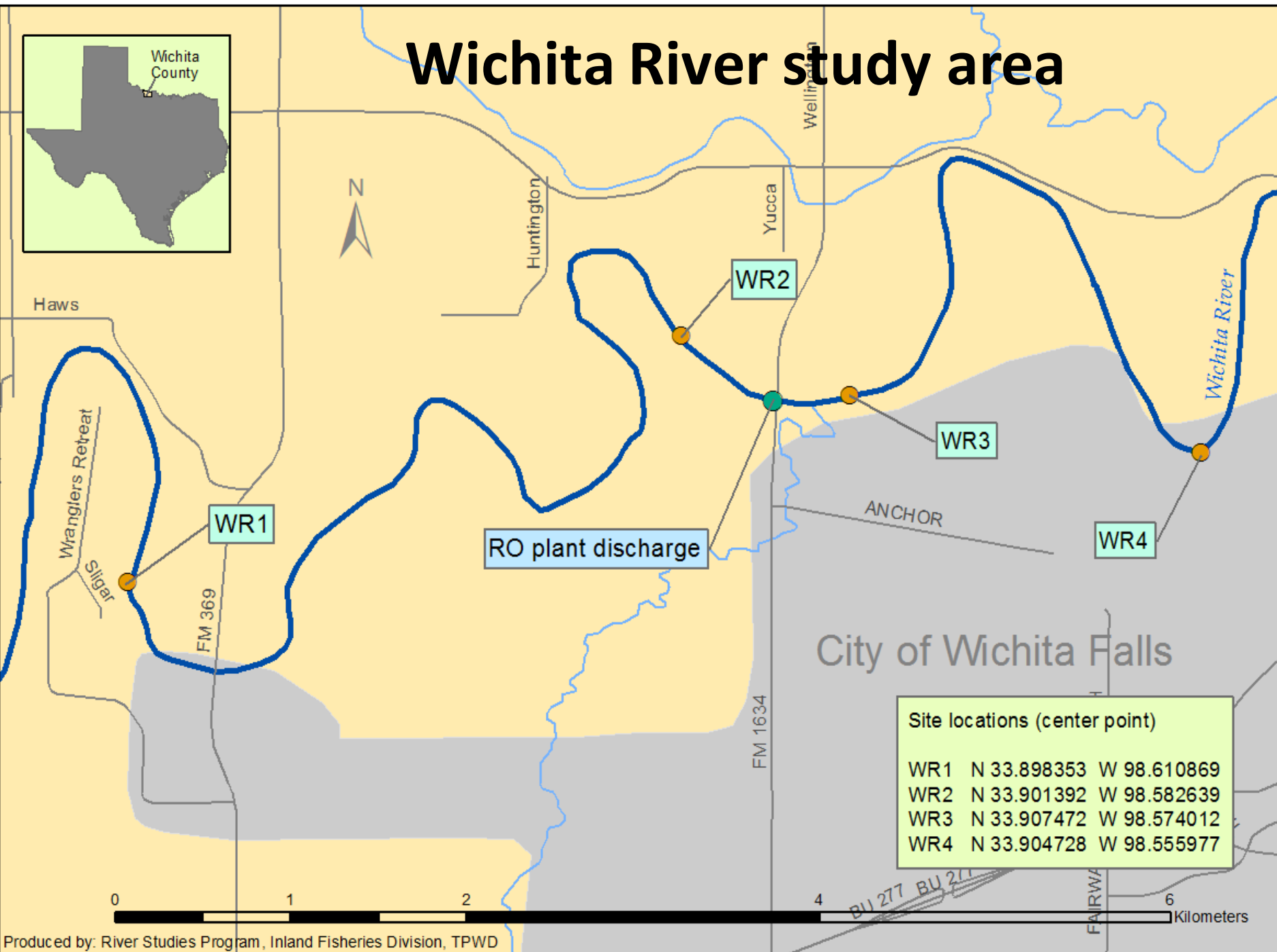


FIGURE ES.2. PROJECTED WATER DEMAND AND EXISTING SUPPLIES (ACRE-FEET PER YEAR).



Type of Water Management Strategy	2020	2030	2040	2050	2060
Municipal Conservation	264,885	353,620	436,632	538,997	647,361
Irrigation Conservation	1,125,494	1,351,175	1,415,814	1,463,846	1,505,465
Other Conservation *	9,242	15,977	18,469	21,371	23,432
New Major Reservoir	432,291	918,391	948,355	1,230,573	1,499,671
Other Surface Water	1,510,997	1,815,624	2,031,532	2,700,690	3,050,049
Groundwater	443,614	599,151	668,690	738,484	800,795
Reuse	428,263	487,795	637,089	766,402	915,589
Groundwater Desalination	81,156	103,435	133,278	163,083	181,568
Conjunctive Use	88,001	87,496	113,035	136,351	135,846
Aquifer Storage and Recovery	61,743	61,743	72,243	72,243	80,869
Weather Modification	15,206	15,206	15,206	15,206	15,206
Drought Management	461	461	461	461	1,912
Brush Control	18,862	18,862	18,862	18,862	18,862
Seawater Desalination	125	143	6,049	40,021	125,514
Surface Water Desalination	2,700	2,700	2,700	2,700	2,700
Total Supply Volumes	4,483,040	5,831,779	6,518,415	7,909,290	9,004,839

Wichita River study area



Site locations (center point)

WR1	N 33.898353	W 98.610869
WR2	N 33.901392	W 98.582639
WR3	N 33.907472	W 98.574012
WR4	N 33.904728	W 98.555977





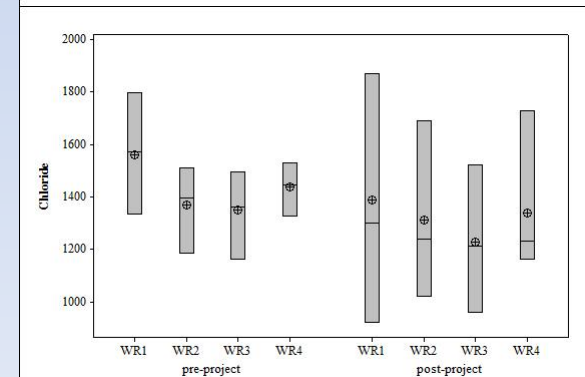
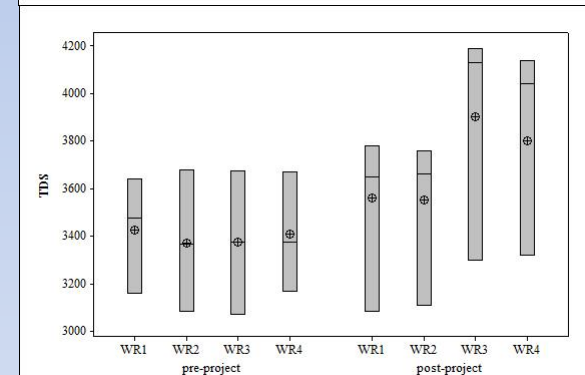
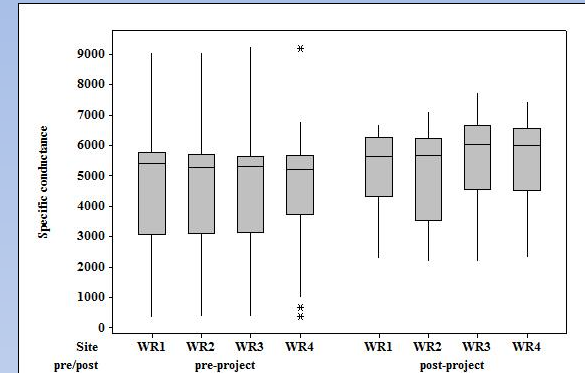
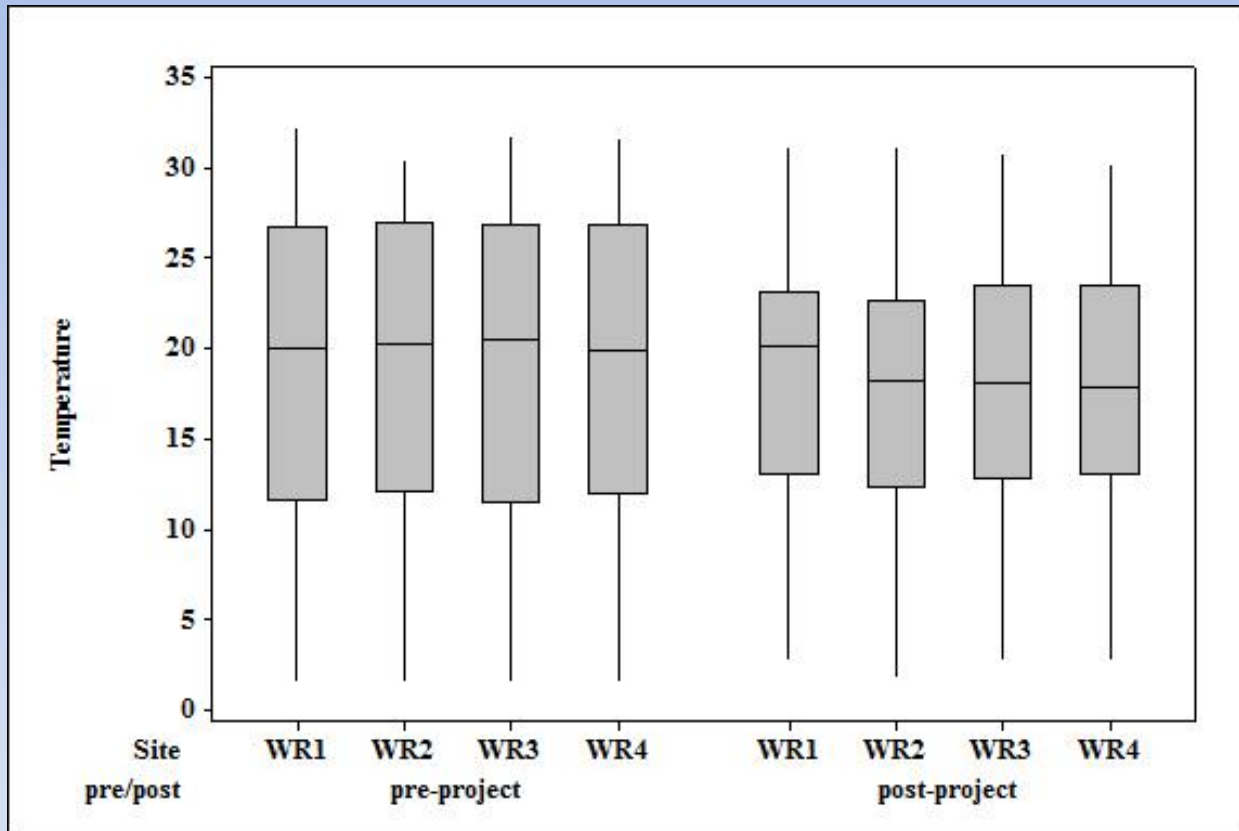




RESULTS

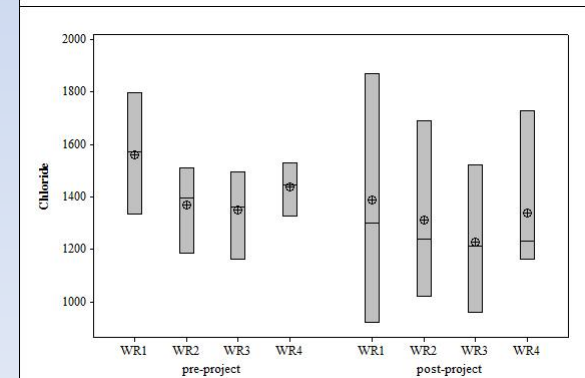
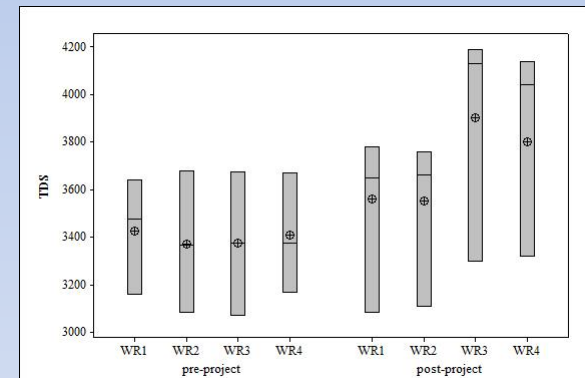
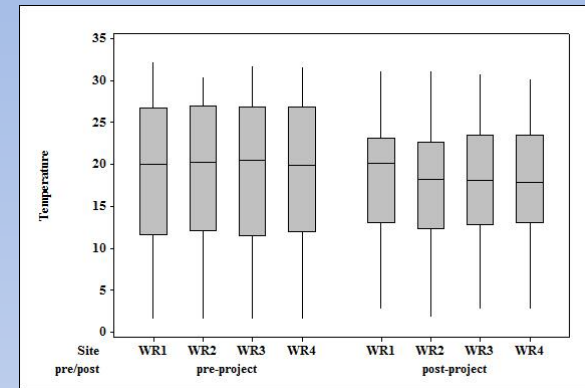
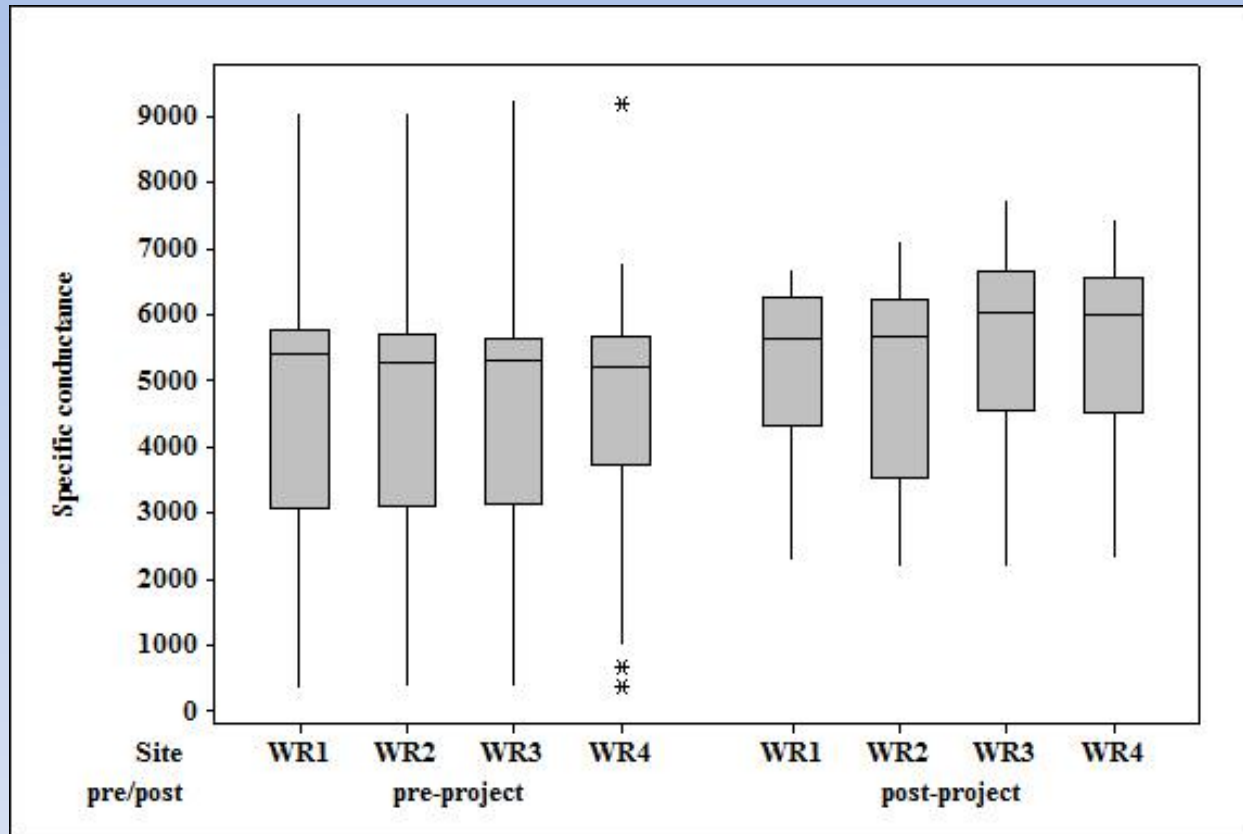
Water parameters pre-/post-Project

Temperature



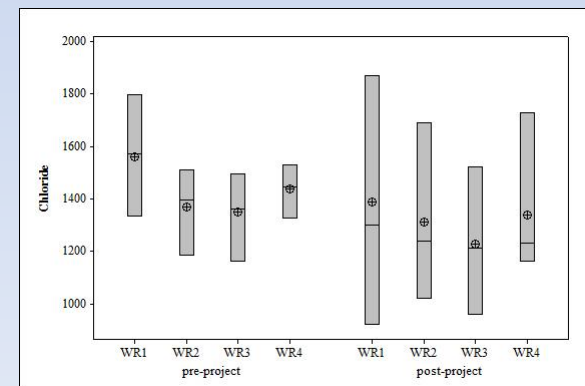
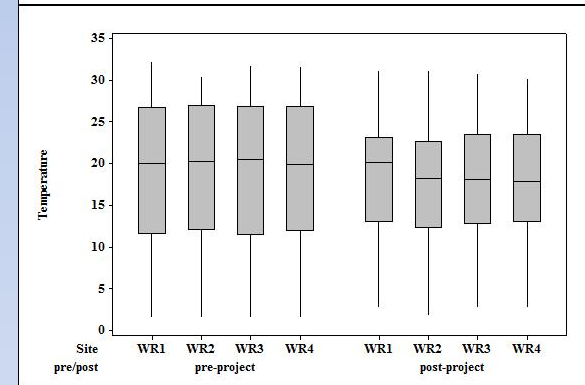
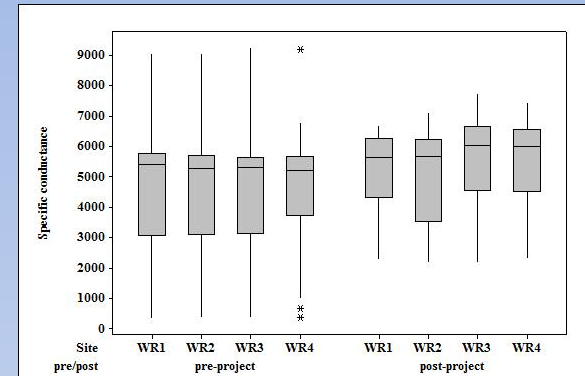
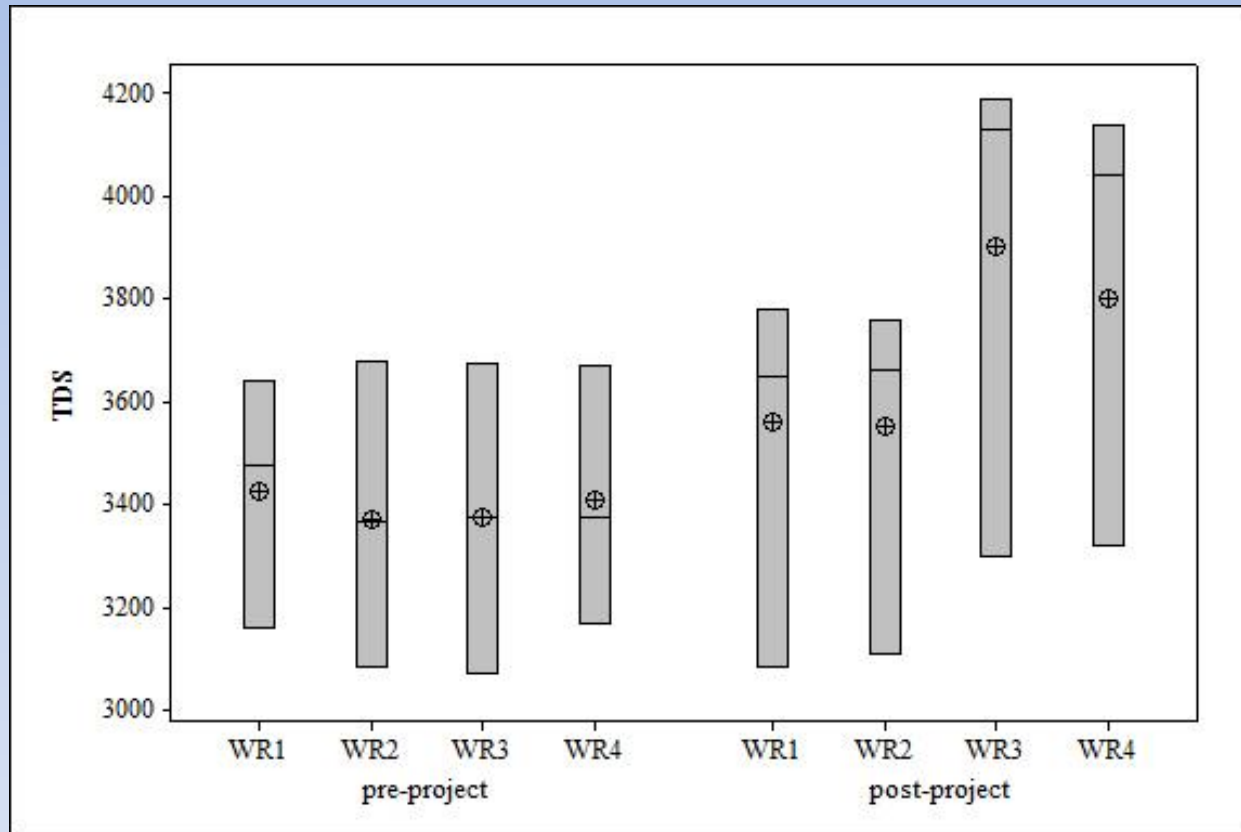
Water parameters pre-/post-Project

Specific Conductance



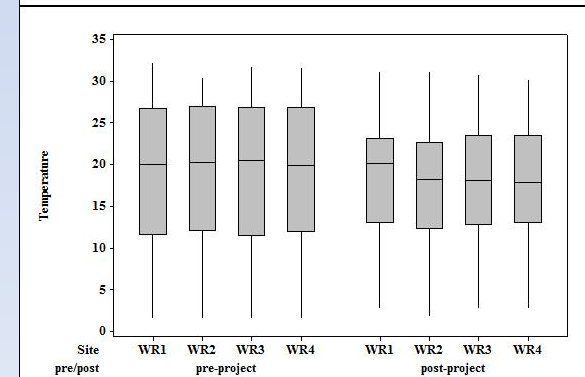
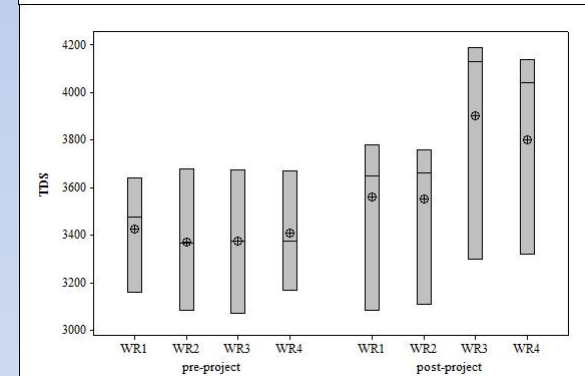
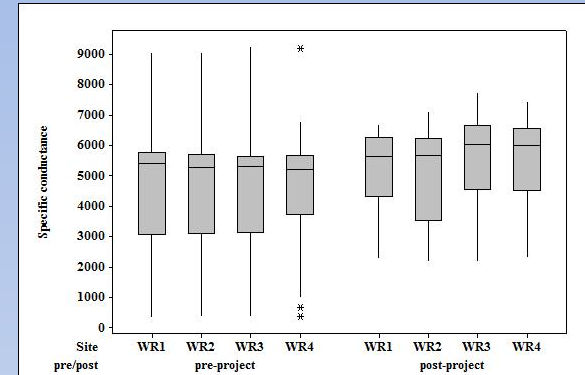
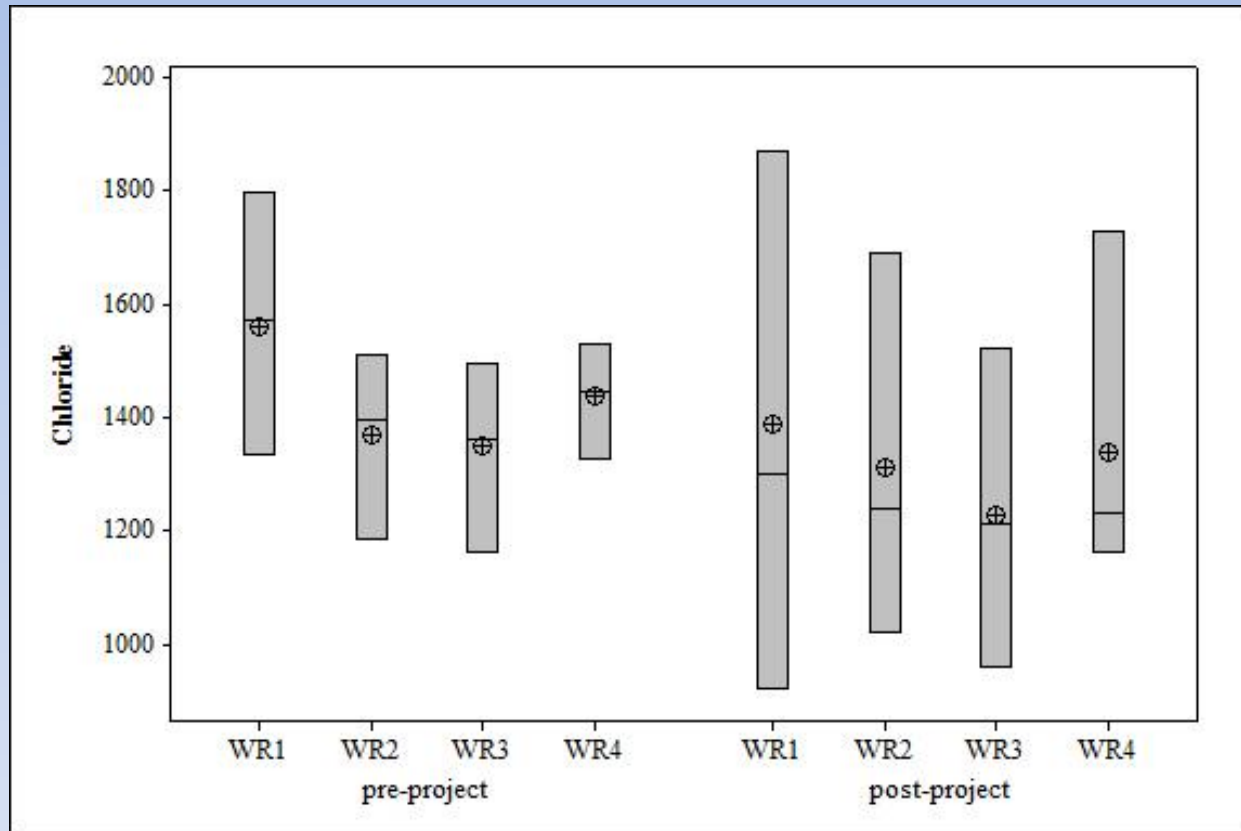
Water parameters pre-/post-Project

Total Dissolved Solids

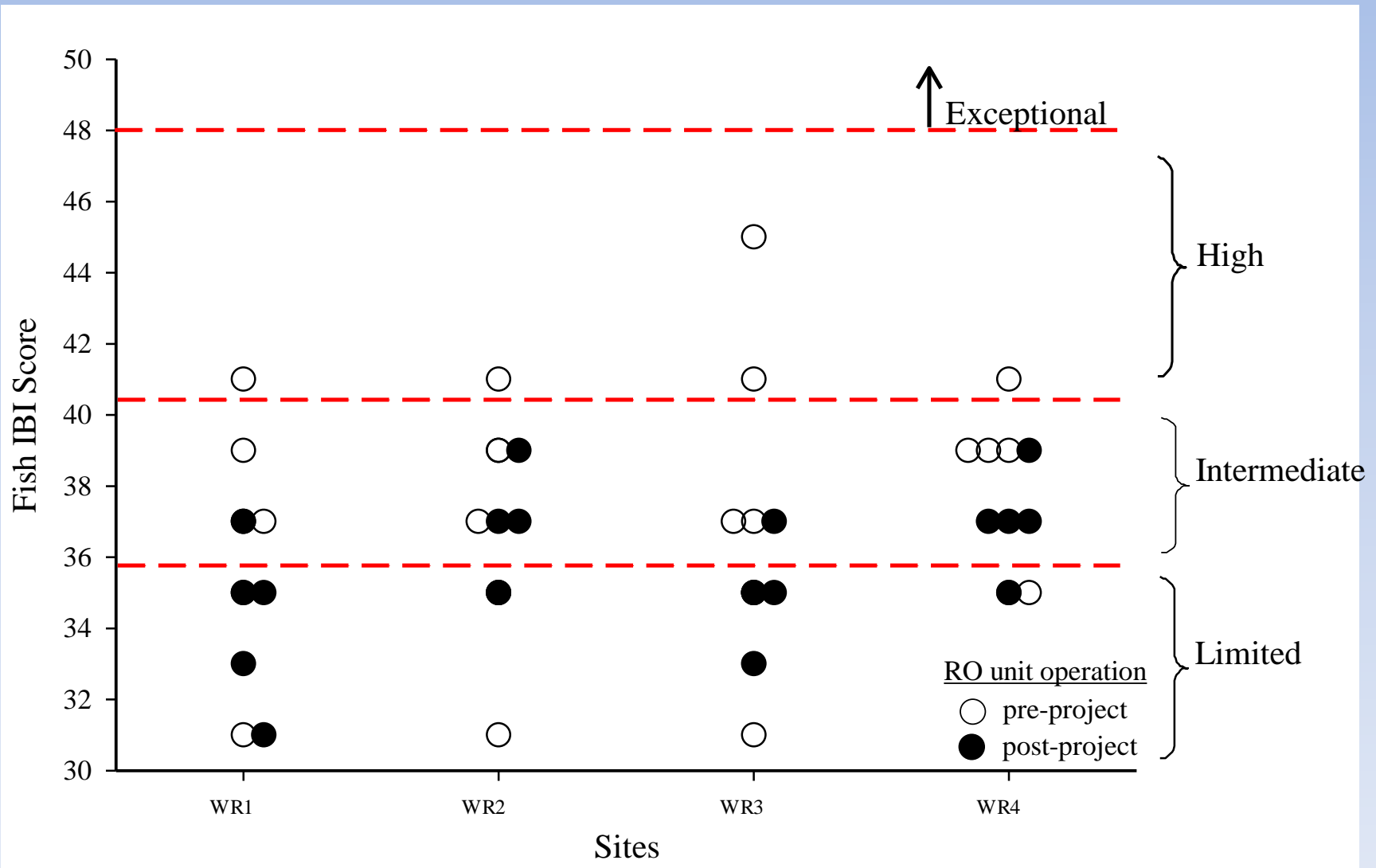


Water parameters pre-/post-Project

Chloride



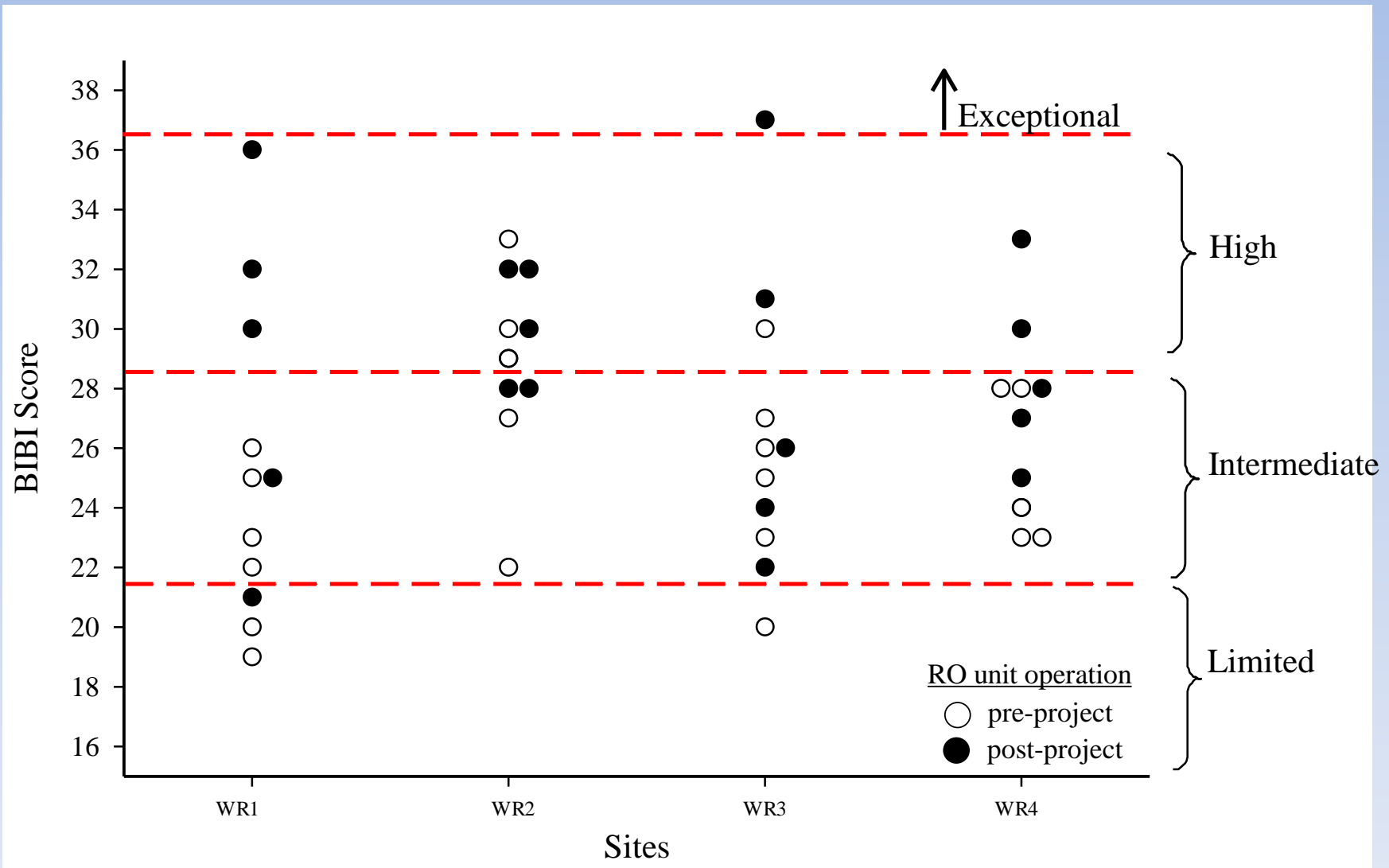
Fish index of biotic integrity (IBI) scores and associated aquatic life use categories from four sites on the Wichita River



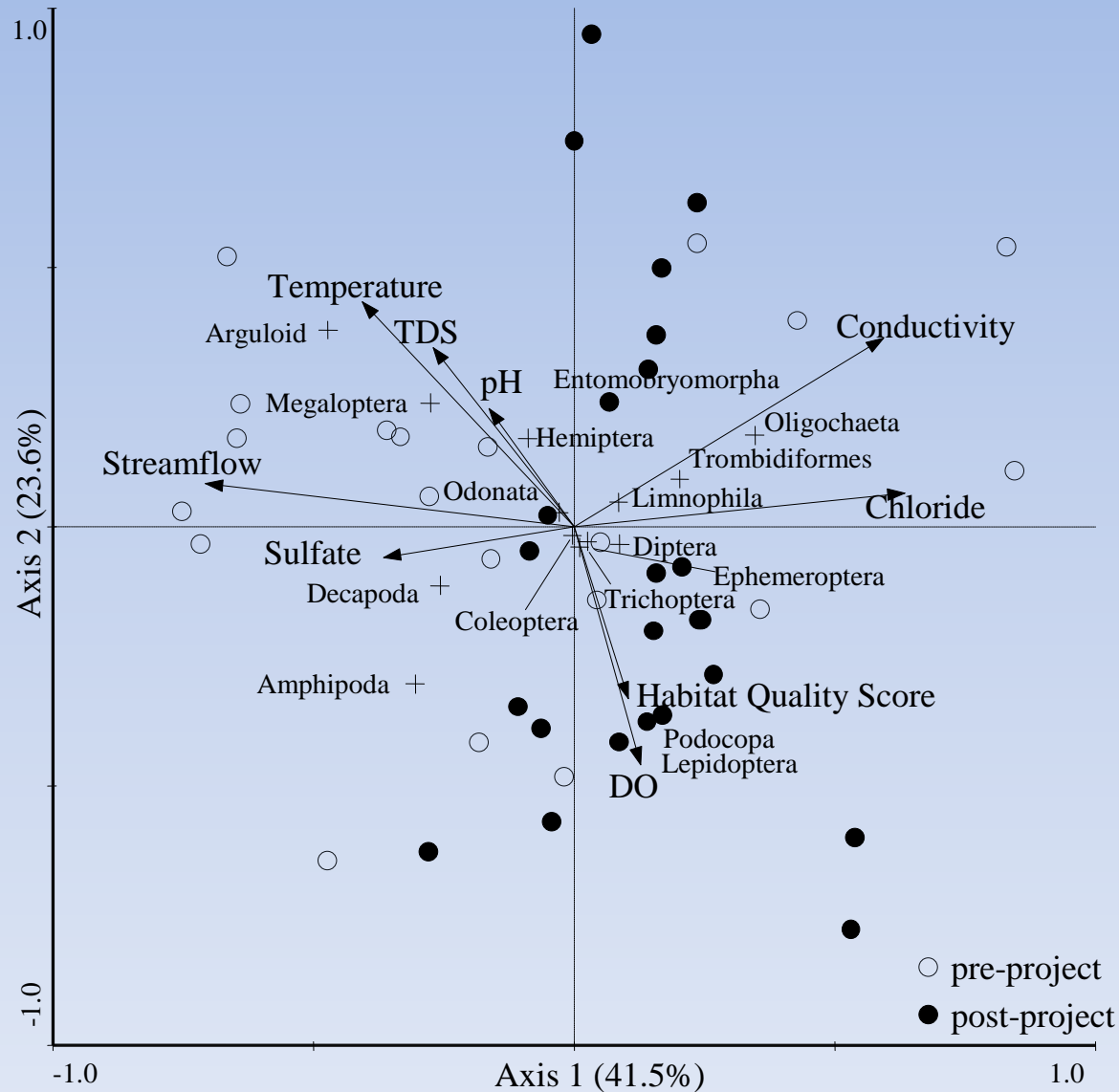
Macroinvertebrate Results

- 9,055 benthic macroinvertebrates
- 16 Orders, 55 Families, and 63 Genera
- Ephemeroptera – 63%
- Trichoptera – 21%
- Diptera – 14%
- Coleoptera – 13%

Benthic index of biotic integrity (BIBI) scores and associated Aquatic Life Use categories from four sites on the Wichita River



Canonical correspondence analysis for macroinvertebrate taxa & environmental parameters collected from Wichita River



Conclusions

- Sp. Conductance, TDS, Chloride – not significantly different.
- Values throughout the system were higher in Post-Project period.
- Minimal effect on Benthic Macroinvertebrate assemblage.
- Seasonal variation was strongest factor in structuring macroinvertebrate assemblage.

This study serves as a baseline for future assessments.

Monitoring studies should be conducted for several years when the discharge volume increases.

Acknowledgements

Project Partners

Archis R. Grubh, Clinton R. Robertson, Karim Aziz, Leroy J. Kleinsasser,
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Water Quality Assessment

Gary Steinmetz and Greg Southard

Questions



Effects of the R/O plant on the Benthic Macroinvertebrates, Wichita River, TX

